461.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

461.04.01 Metal Railing will be measured and paid for at the Contract unit price per linear foot.

461.04.02 Metal Railing will not be measured but will be paid for at the Contract lump sum price.

461.04.03 Metal railing for which no specific item is included in the Contract Documents will not be measured but the cost will be incidental to other pertinent items included in the Contract Documents.

SECTION 462 — TIMBER STRUCTURES

462.01 DESCRIPTION. This work shall consist of constructing structures or portions of structures using timber, including fabrication, erecting, treating and coating of the timber elements as specified in the Contract Documents or as directed by the Engineer.

For timber piling refer to Section 410. For structural steel refer to Section 430. For concrete refer to Section 420.

462.02 MATERIALS.

Asphalt Cement	904.01
Structural Steel	909.01
Gray Iron Castings	909.04
Bolts and Hardware	909.10
Structural Timber	921.05
Preservative Treatments for Timber	921.06
Metal Timber Connectors	Per manufacturer & approved by the Engineer
Galvanizing	A 153
Fire Stops and Galvanized Sheet Metal	A 653, Coating Designation G 90

462.03 CONSTRUCTION.

462.03.01 Storage and Handling. Timber shall be open stacked in piles at least 12 in. above the ground surface in a manner to shed water and prevent warping. It shall be protected from weather by a suitable

covering. The storage site shall be cleared of weeds and rubbish before placing material and throughout the storage period. The site selected shall not be subject to flooding. Timber shall be handled with rope or nylon slings to prevent the breaking of outer fibers, bruising, or penetrating the surface.

462.03.02 Cutting and Boring. When practical, cutting and boring of treated timbers shall be done before pressure treatment with preservatives. All cuts in treated timbers and all abrasions (after having been carefully trimmed) shall be brush coated with two applications of an approved wood preservative before installing the timber in the structure. When the Engineer determines that treated timbers are damaged beyond repair, they shall be removed from the project and replaced at no additional cost to the Administration.

When forms or temporary braces are attached to treated timber with nails or spikes, the holes shall be filled by driving galvanized nails or spikes flush with the surface, as directed by the Engineer.

462.03.03 Bolt Holes. Bolt holes bored after treatment shall be filled with asphalt cement applied with a caulking gun or as directed by the Engineer before inserting bolts. Holes that are not to receive bolts shall be plugged with asphalt cement coated plugs.

462.03.04 Coating Untreated Surfaces. In untreated timber structures, all contact surfaces between any members (except adjacent flooring members) shall be coated with two coats of an approved preservative before assembling. The back faces of bulkheads and all surfaces of timber that will come in contact with earth, metal, or other timber shall be similarly coated. The ends of timber members shall be coated in the same manner.

462.03.05 Protection of Ends of Caps, Wales, and Planks. The ends of all caps, wales, and planks shall be covered with resin glass composite shields as approved by the Engineer. The shields shall be applied as follows:

(a) Remove all dirt and other loose material from area to be capped.

(b) Apply the first coat of resin to the top and 4 in. down the side of the member.

(c) Apply precut glass cloth, using a 3 in. grooved aluminum roller to achieve "wet-out" and brass staples for anchorage.

(d) When the initial coat of resin has taken a tack free set, apply a second coat of resin to seal the entire application.

462.03.06 Diameter of Holes. Holes bored in timber structures shall conform to the following:

(a) Round drift bolts, spikes, and dowels - 1/16 in. less than the diameter of the device.

(b) Square drift bolts, spikes, and dowels - equal to the smallest dimension of the device.

(c) Machine bolts - same as the diameter of the bolts.

(d) Rods - 1/16 in. larger than the diameter of the rods.

(e) Lag screws - equal to the diameter of the screw at the base of the thread.

(f) Connector bolts - 1/16 in. larger than the diameter of the connector bolts.

462.03.07 Bolt Assemblies. Bolt heads or nuts, which come in contact with the timber, shall be fitted with a washer of the size and type specified. After all nuts are adequately tightened, the bolt threads shall be burred.

462.03.08 Countersinking. Countersinking shall be done wherever smooth faces are required. In treated timber, recesses formed in horizontal surfaces for countersinking shall be painted with an approved preservative. After the bolt or screw is in place, recesses shall be filled with an approved asphalt coating.

462.03.09 Connectors. Connector holes shall be bored through members to be connected. The bolt hole shall be kept perpendicular to the face of the timber. When spike grids or split ring connectors are specified in the Contract Documents, they shall be installed in conformance with the manufacturer's recommendations.

462.03.10 Framing. All timber shall be accurately cut and framed to provide even bearing over the entire contact surface. When making joints, shimming and open joints are prohibited.

462.03.11 Sills. Sills shall have true and even bearing on mudsills or concrete pedestals. All earth shall be removed from contact with sills.

462.03.12 Timber Caps. Timber caps shall be placed to secure an even and uniform bearing over the tops of the supporting posts or piles and to secure an even alignment of their ends. All caps shall be secured by drift

bolts or as specified in the Contract Documents. The drift bolts shall be in the center of the post or pile.

462.03.13 Bracing. The ends of bracing shall be bolted through the pile, post, or cap. Intermediate intersections shall also be bolted. Spikes or nails shall be used in addition to bolts. When bracing intersects, filler blocks shall be used with a bolted connection.

462.03.14 Stringers. Stringers shall be placed in position so that knots near edges will be in the top portions of the stringers. Bottom edges of stringers shall be sized to provide uniform depth at bearings.

Outside stringers may have butt joints with the ends cut on a taper, but interior stringers shall be lapped to take bearing over the full width of the floor beam or cap at each end. The lapped ends of untreated stringers shall be separated a minimum 1/2 in. and shall be securely fastened by drift bolts where specified. When stringers are two panels long, the joints shall be staggered.

Cross bridging between stringers shall be toenailed with at least two nails in each end. The lower ends of all bridging and one side of each diaphragm shall be left disconnected and free to move until after the deck above it has been securely fastened to the stringers.

462.03.15 Floor Planking. Floor planking shall, unless otherwise specified, be SIS and SIE, hit or miss, and the planks shall be of uniform thickness with a maximum tolerance of 1/8 in. Where necessary to maintain traffic, planks shall be laid in half-of-bridge width sections. Timber plank floors shall always be accompanied with suitable hold down devices. Planks shall be spiked to every stringer or joist or nailer using not less than two spikes, and the length of the spikes shall be at least equal to twice the thickness or depth of the plank. Where planks will be under wheel guards or hold down devices, care shall be taken while selecting planks of as near equal thickness as possible. Before any hold down or wheel guard is bolted, treated shims or wedges shall be firmly driven between low planks and hold down and low planks and wheel guard so that all planks shall be held down with equal pressure. The shims shall occupy at least 50 percent of the area between the bottom of the hold down and the top of the plank and between the bottom of the wheel guard and the top of the plank.

462.03.16 Bridge Railings and Wheel Guards. Bridge railings shall conform to Performance Level 1 (PL-1) as specified in the AASHTO Guide Specifications for Bridge Railings. All dimensions for timber rail, posts, and spacers shall be the actual dimensions of the timber.

Bridge rail and wheel guard splices shall be located so that rail and guard members are continuous over a minimum of two posts. Bridge railings and wheel guards shall be installed in sections not less than 12 ft long. Splices shall be shiplapped with the lap equal to 8 in. or the greater side of the piece, whichever is larger.

462.04 MEASUREMENT AND PAYMENT. Piles are excluded. The payment will be full compensation for all timber (treated or untreated) storage and handling, preservative, composite shields, asphalt cement, metal components, drilling holes, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

462.04.01 Timber structures will be measured and paid for at the Contract unit price per 1000 board feet "MBM". The computation of quantities will be based on the nominal sizes specified in the Contract Documents and the exact overall net length of pieces remaining in the completed structure. No allowance will be made for waste.

462.04.02 Timber structures will not be measured but will be paid for at the Contract lump sum price.

SECTION 463 — BRICK MASONRY

463.01 DESCRIPTION. This work shall consist of brick laid in full beds of mortar and built to the shapes and dimensions and at the locations specified in the Contract Documents or as directed by the Engineer.

463.02 MATERIALS.

Curing Compound	902.07.03
Brick	903
Mortar	903.06
Fusion Bonded Epoxy Powdered Coatings	917.02
Water	921.01
Dove Tail Anchors	As specified in the Contract Documents

Sample Panel. When specified in the Contract Documents, a sample panel measuring a minimum of 24 x 24 in. shall be prepared and delivered to the construction site. The panel shall be typical of the brickwork to be used on the project. The Administration's approval of the panel shall be received before beginning the brickwork on the project. The sample panel shall remain on the project site and all subsequent brickwork shall be equal in appearance to this approved panel.